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is so great that it will be found more convenient and economical to have a separate ash handling system.

It will be seen that in all the above examples of ash handling plant the ashes are received in a more or less red-hot condition from the ash hoppers under the boilers, and that it is necessary to quench the ashes on the conveyors

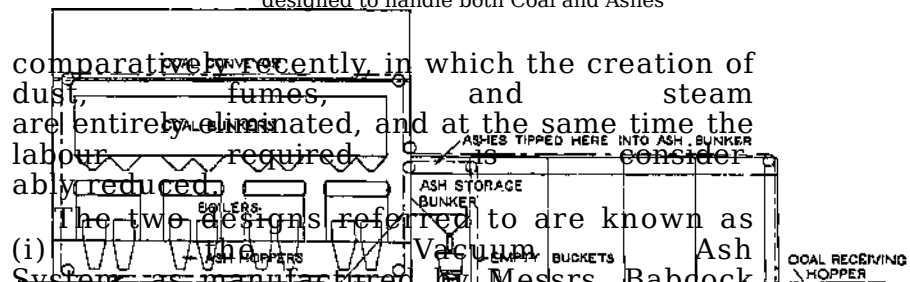
or in the ash wagons. It is inevitable, therefore, that considerable quantities of steam and dust are liberated, which are not only very destructive to any machinery and steelwork with which they come into contact, but also create an atmosphere which makes the operation of ash plant extremely trying

to the men and detrimental to their health, with the result that men cannot

work continuously in the ash tunnels, and it is necessary to have a large staff of men with consequent high costs.

Two notable advances in ash handling plant design have been made

Fig. 21.—Typical Arrangement of Coal Elevator designed to handle both Coal and Ashes



comparatively recently, in which the creation of dust, fumes, and steam are entirely eliminated, and at the same time the labour required is considerably reduced.

The two designs referred to are known as (1) the Vacuum Ash System, as manufactured by Messrs. Babcock & Wilcox, Ltd.; and (2) the Water-sealed Ash Conveyor, manufactured by the Underfeed Stoker Company, Ltd.

Vacuum Ash System.—In this system the ashes are conveyed through a series of pipes by a high-velocity current of air, and thereby carried into an ash receiver from which they are discharged periodically for removal by rail or road.

A diagrammatic arrangement of a vacuum ash system is shown in fig. 22,

in which the ash hoppers below the boilers are indicated at A. The ash pipes B are provided with openings under each boiler ash hopper to receive the ashes. These openings are provided with lids to close them when not in use. The end of the ash pipe B is left open to the atmosphere at c, and the main supply of air for conveying the ashes enters the system at this point. The ash pipe B is led to an ash receiving bunker E, where the ashes are delivered and quenched by water sprays J. The ash receiver is provided with